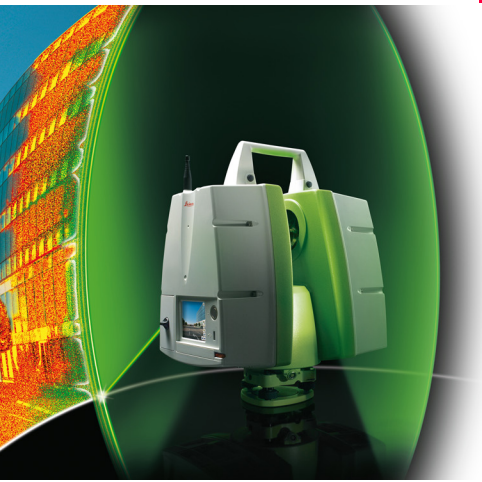


Leica ScanStation C10

System Field Manual

Version 1.0
English

- when it has to be **right**

Leica Geosystems

Introduction

To use the product in a permitted manner, please refer to the detailed safety directions in the User Manual.

Purchase

Congratulations on the purchase of a ScanStation C10 instrument.

Product identification

The type and the serial number of your product are indicated on the type plate. Enter the model and serial number in your manual and always refer to this information when you need to contact your agency or Leica Geosystems authorised service workshop.

Type: _____

Serial No.: _____

Symbols

The symbols used in this manual have the following meanings:

Type	Description
	Important paragraphs which must be adhered to in practice as they enable the product to be used in a technically correct and efficient manner.

Trademarks

- Windows is a registered trademark of Microsoft Corporation

All other trademarks are the property of their respective owners.

Available documentation

Name	Description/Format		
Leica ScanStation C10 User Manual	All instructions required in order to operate the product to a basic level are contained in the User Manual. Provides an overview of the product together with technical data and safety directions.	✓	✓

Name	Description/Format		
Leica ScanStation C10 System Field Manual	Describes the general operation of the product in standard use. Intended as a quick reference field guide.	✓	✓
Leica Geosystems HDS Training Manual	Training manual provided in the Leica HDS training course by the local Leica HDS training and support team.		

Refer to the following resources for all ScanStation C10 documentation and software

- Leica ScanStation C10 System CD-ROM
- http://www.leica-geosystems.com/downloads
- http://www.leica-geosystems.com/en/HDS-Laser-Scanners-SW_5570.htm

Table of Contents

In this manual

Chapter		Page
1	**Description of the System**	**10**
1.1	Packing / Unpacking	10
2	**Setting Up the Instrument**	**12**
2.1	General Information	12
2.2	Scanner Setup on Tripod	13
2.3	Setup Over a Benchmark with the Internal Laser Plummet	15
2.4	Instrument Height	18
3	**Description of the User Interface**	**20**
3.1	Front Side	20
3.2	Display	21
3.3	Status Bar	23
3.4	User Input	28
4	**Switching the System On/Off**	**30**
5	**Main Menu**	**32**

6 Scan **34**

6.1 Scan\Scan Begin 35
6.2 Scan\Scan Parameter 40
6.2.1 Scan\Scan Parameter\Field of View 41
6.2.2 Scan\Scan Parameter\Resolution 51
6.2.3 Scan\Scan Parameter\Image Control 56
6.2.4 Scan\Scan Parameter\...\Target Definition 63

7 Manage **76**

7.1 Manage\New Project 78
7.2 Manage\Edit Project 80
7.3 Manage\Delete Project 82
7.4 Manage\Data 84
7.5 Manage\Transfer Project 89

8 Status **90**

8.1 Status\Battery & Memory 93
8.2 Status\System Information 97
8.3 Status\Level & Laser Plummet 101
8.4 Status\WiFi 108

9 Configuration 114

9.1 Config\Units 116
9.2 Config\Time & Date 118
9.3 Config\Language 120

10 Tools 122

10.1 Tools\Format 124
10.2 Tools\Transfer 126
10.3 Tools\License 133
10.4 Tools\Display Calibration 137

11 Menu Tree 140

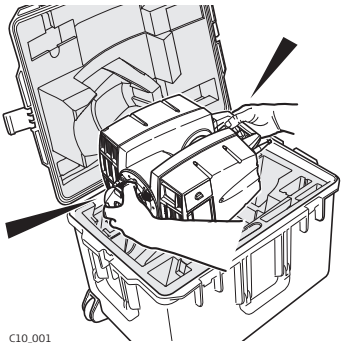
Index 148

1 Description of the System

1.1 Packing / Unpacking

Unpacking

When in its transport container, the ScanStation C10 can sit in either a face-up or face-down position.



To take the instrument out of its container, grasp the handle and the base of the instrument, and lift.
Use caution due to the weight of the instrument (13 kg).

Pack the instrument the same way it is delivered.

2 Setting Up the Instrument

2.1 General Information

Use the tripod

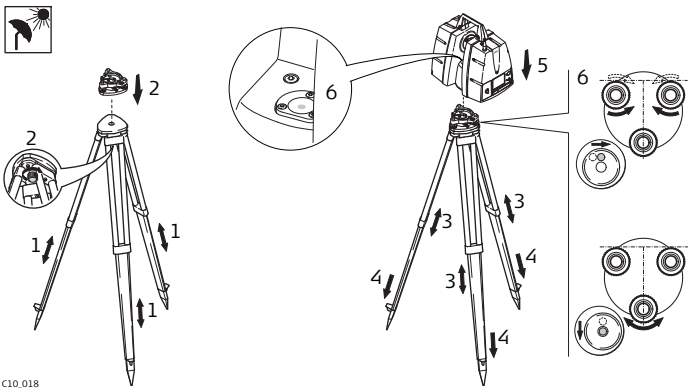
The instrument should always be set up on its tripod. Using the tripod specified for the scanning system guarantees maximum stability during scanning operations.

Always set up the instrument on its tripod. Do not set up the instrument directly on the ground for scanning operations.

It is always recommended to shield the instrument from direct sunlight and avoid uneven temperatures around the instrument.

2.2 Scanner Setup on Tripod

Setup step-by-step



Shield the instrument from direct sunlight and avoid uneven temperatures around the instrument.

1. Extend the tripod legs to allow for a comfortable working posture. Tighten the screws at the bottom of the legs.
2. Place the tribrach on the tripod and secure it with the central fixing screw.
3. Set up the tripod so that the tripod plate is as horizontal as possible.
4. Push the tripod legs firmly into the ground.
5. Place the instrument on the tribrach and secure it with the tribrach's locking knob.
6. Level up the instrument using the instrument's circular level. Turn two of the foot screws together in opposite directions. The index finger of your right hand indicates the direction in which the bubble should move. Now use the third foot screw to centre the bubble.

2.3 Setup Over a Benchmark with the Internal Laser Plummet

Description

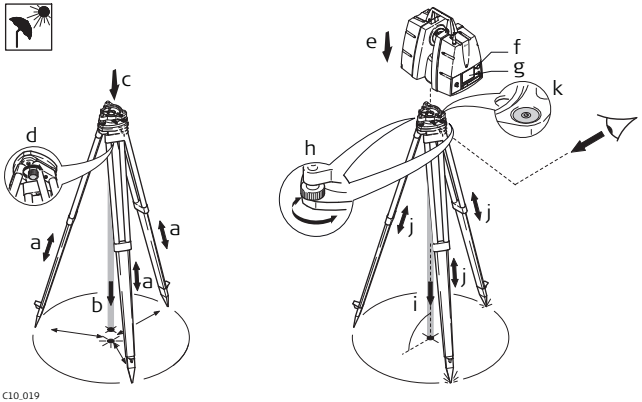
This topic describes an instrument setup over a marked ground point using the laser plummet. Geo-referencing of the ScanStation C10 is established by setting up over a known or assumed control point, with optional reference target measurement to set the azimuth direction, and establishing a local or global coordinate system.
The ScanStation C10 allows you to traverse, resect or free-station. Known azimuth or known backsight measurements can be observed.

It is always possible to set up the instrument without the need for a marked ground point.

The data scanned with ScanStation C10 is corrected by an internal dual-axis compensator, when the dual-axis compensator is enabled (via onboard control or *Cyclone*).

- The laser plummet described in this topic is built into the vertical axis of the instrument. It projects a red spot onto the ground, making it much easier to centre the instrument.
- The laser plummet cannot be used in conjunction with a tribrach equipped with an optical plummet.

Setup step-by-step



Shield the instrument from direct sunlight and avoid uneven temperatures around the instrument.

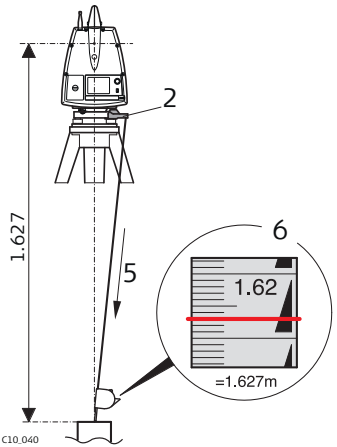
1. Extend the tripod legs to allow for a comfortable working posture (a). Position the tripod approximately over the marked ground point, centring it as well as possible (b).
2. Place the tribrach on the tripod (c) and secure it with the central fixing screw (d).

3. Place the instrument on the tribrach (e) and secure it with the tribrach's locking knob.
4. Turn on the instrument by pressing the ON/OFF button (f). Go to **Status**, **Level and Laser Plummet**, **Plummet** and activate the laser plummet (g).
5. Move the tripod legs (a) and use the tribrach footscrews (h) to centre the plummet (i) over the ground point.
6. Adjust the tripod legs (j) to level the circular level (k).
7. By using the electronic level (**Status**, **Level and Laser plummet**, **Level**) turn the tribrach footscrews (h) to precisely level the instrument.
8. Centre the instrument precisely over the ground point (i) by shifting the tribrach on the tripod plate.
9. Repeat steps 7. and 8. until the required accuracy is achieved.

2.4 Instrument Height

Measure instrument height

To get an accurate height measurement use the GHM008 instrument height meter in conjunction with the GHT196 distance holder which are both included with the scanner.



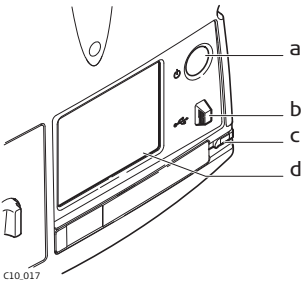
1. Place tripod centrally over the ground point, level instrument.
2. Click GHT196 distance holder to tribrach. It must "snap" onto the cover over an adjusting screw.
3. Unfold measuring tongue, pull out tape measure a little.
4. Insert GHM008 instrument height meter in the distance holder and attach.
5. Swivel measure in the direction of the ground point, pull out until the tip of the measuring tongue touches the point on the ground, keep under tension and do not allow to sag, clamp if necessary.
6. Read height of the instrument (ground - tilt axis) in the reading window at the red marking (in the example 1.627 m).

- For detailed information about the GHM008 instrument height meter and GHT196 distance holder refer to the GHM008/GHT196 user manual which is delivered with these items.
- The tilt axis height of the ScanStation C10 is 250 mm. Take care to use the GHM008 which has a special scale to measure the height of instruments with a tilt axis height of 250 mm. Do not use a tape with any other scale.
- Alternatively the instrument height can be measured with a common, 1:1 scaled measuring tape from the point on the ground to the little notch under the red Leica logo at both side covers of the scanner. This distance will then be from the ground point to the tilt axis.

3 Description of the User Interface

3.1 Front Side

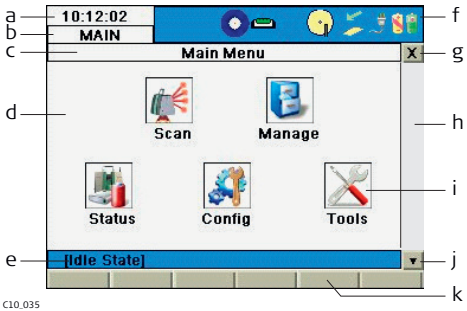
Overview



a) ON/OFF button
b) USB socket
c) Stylus
d) Touchscreen user interface

3.2 Display

Overview



a) Time
b) Caption
c) Title bar
d) Screen area
e) Message bar
f) Status bar
g) Escape button
h) Scroll bar
i) Menu icon
j) SHIFT button
k) Softkeys

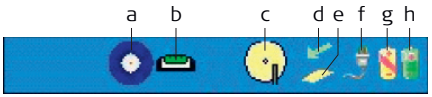
Element	Description
Time	The current local time is shown.
Caption	Shows location in menu system.
Title bar	Shows name of current screen.
Screen area	Working area of the screen.

Element	Description
Message bar	Shows messages.
Status bar	Shows current status information for the instrument.
Escape button	Returns to the previous screen.
Scroll bar	Scrolls the screen up and down.
Menu icon	Selecting menu icons opens submenus. Menu icons will change depending on which menu is displayed.
SHIFT button	Displays the second level of softkeys.
Softkeys	Commands can be executed with the softkeys. Commands assigned to the softkeys are menu dependent.

3.3 Status Bar

Overview

The icons in the status bar display the current status information of the instrument. Clicking a status icon gives direct access to a detailed status description.



C10_036

a) Active target type
b) Dual-axis compensator
c) Internal hard disc
d) Status of external memory
e) External memory
f) External battery / AC power supply
g) Internal battery A
h) Internal battery B

- **Internal battery A** indicates the status of the battery in compartment A which is located at the same side cover as the touchscreen.
- **Internal battery B** indicates the status of the battery in compartment B at the opposite cover without a screen.

Icon		Status
Active target type		HDS target
		HDS black/white target
		HDS sphere target
		Twin target top
		Twin target top with extension
		Twin target bottom
		Twin target bottom with extension
Dual-axis compensator		On and levelled
		Off
		On but out of range

Icon		Status
Internal hard disc		Empty
		13% memory used
		25% memory used
		38% memory used
		50% memory used
		63% memory used
		75% memory used
		88% memory used
		Full
Status of external memory		Ready to be removed.
		Do not remove!

Icon		Status
External memory		Empty
		17% memory used
		33% memory used
		50% memory used
		67% memory used
		83% memory used
		Full
External battery / AC power supply		Empty
		20% capacity
		40% capacity
		60% capacity
		80% capacity
		Full
		AC power supply

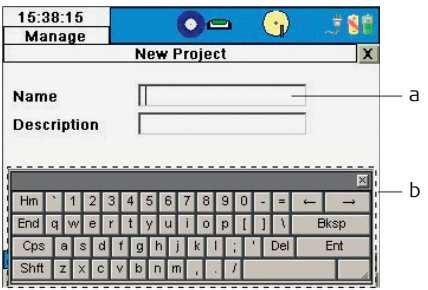
Icon		Status
Internal battery A/B		Empty
		Currently in use - 20% capacity
		Currently in use - 40% capacity
		Currently in use - 60% capacity
		Currently in use - 80% capacity
		Currently in use - full
		Currently not in use - empty
		Currently not in use - 20% capacity
		Currently not in use - 40% capacity
		Currently not in use - 60% capacity
		Currently not in use - 80% capacity
		Currently not in use - full

3.4 User Input

Overview

The system offers two different virtual keyboards for user input:

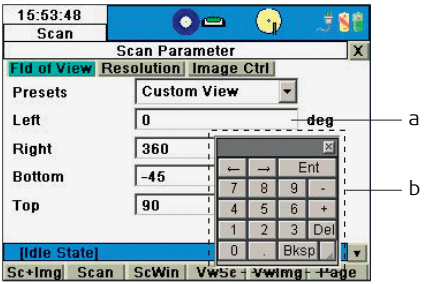
1. **User input for alphanumeric input fields:**
   When an alphanumeric input field is selected with the stylus, an alphanumeric keypad opens offering letters, numbers and special characters.



C10_037

a) Alphanumeric input field
b) Alphanumeric keypad

2. **User input for numeric input fields:**
   When a numeric input field is selected with the stylus, a numeric keypad opens offering numbers and some special characters.



C10_038

a) Numeric input field
b) Numeric keypad

4 Switching the System On/Off

Switch on procedure

1. Set up the instrument as desired. Refer to chapter "2 Setting Up the Instrument" for more information.
2. Press and hold the ON/OFF button until a beep is audible.
3. The instrument's fan starts.
4. The **Leica Geosystems** welcome screen starts.
5. Wait until the Main Menu appears on the display and the **Idle State** message is shown in the message bar.
6. Once in **Idle State** the scanner is ready for operation.

Switch off procedure

1. From the current menu return to the **Main Menu**.
2. In the **Main Menu** press the X button.
3. In the popup window confirm the question **Do you really want to power down the scanner?** with **Yes**.
4. Wait for the scanner to shut down.

Alternative switch off procedure

In the event of a system crash follow the alternative switch off procedure:

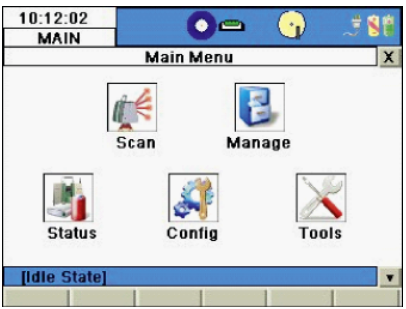
1. Press and hold the ON/OFF button for a minimum of 6 seconds.
2. After 3 seconds a single beep and after 6 seconds a double beep is audible.
3. After the double beep **release** the ON/OFF button.
4. Wait for the scanner to shut down.

5 Main Menu

Description

The **Main Menu** will be displayed after the system boot process. **Idle State** in the message bar indicates that the instrument is ready for scanning.

Main Menu screen



Icon	Function
Scan	Offers access to all commands for scanner operation control.

Icon	Function
Manage	Offers access to all commands for project management.
Status	Offers access to all commands for the scanner's status information.
Config	Offers access to all commands for the configuration of the system.
Tools	Offers access to all commands for disc formatting, data transfer, license management and display calibration.

Menu independent commands:

Command	Function
Escape	Return to previous menu in menu hierarchy.
Shift -> Quit	Return to main menu.
Page	Switch between pages in a menu.

6 Scan

Access

Select **Main Menu, Scan** .

Description

In the **Scan** menu all commands for the scanner operation control are available.

6.1 Scan\Scan Begin

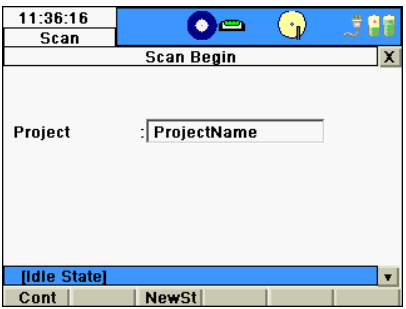
Access

Select **Main Menu, Scan** .

Description

Scan data is stored on the ScanStation C10 by projects which contain stations for each scanner position. In the **Scan Begin** screen a new project can be created or an existing project can be selected. For a chosen project a new station can be defined or an existing one can be used to continue.

Scan Begin screen

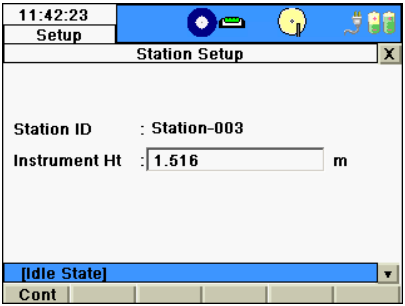


Field	Description
Project	Shows the current project. Click the name field to open the **Manage, Projects** screen for selecting another project, adding a new project, editing or deleting an existing project, and displaying project details.

Available commands:

Command	Function
Cont	Continue with the current project. Opens the **Current Station Information** window.
NewSt	Create a new station. Opens the **Station Setup** screen.

Station Setup screen

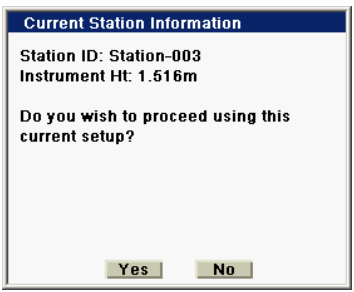


Field	Description
Station ID	Shows new station ID. Cannot be edited.
Instrument Ht	Enter instrument height above ground for new station.

Available commands:

Command	Function
Cont	Confirm new station setup and continue to **Scan Parameter** screen.

Current Station Information message



Option	Description
Yes	Confirm current station setup and continue to **Scan Parameter** screen.

Option	Description
No	Decline current station setup and return to **Scan Begin** screen.

6.2 Scan\Scan Parameter

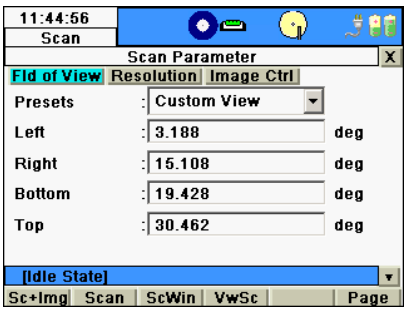
Access

Select **Main Menu, Scan** **, Scan Parameter**.

Description

Once a project and station are chosen, the **Scan Parameter** menu offers three pages for all kinds of scan and image controls: **Fld of View**, **Resolution** and **Image Ctrl**.

Scan Parameter screen



6.2.1 Scan\Scan Parameter\Field of View

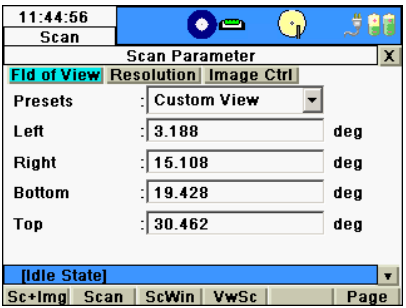
Access

Select **Main Menu, Scan** **, Scan Parameter, Fld of View**.

Description

In the **Fld of View** page of the **Scan Parameter** screen the area to be scanned can be defined by several different methods. For detailed information about the different options and commands that can be executed from this page refer to the descriptions on the following pages.

Fld of View page



Field	Description
Presets	Selection of fixed or user defined area to scan or take pictures.
Left	Left limit of the area to scan or take pictures.
Right	Right limit of the area to scan or take pictures.
Bottom	Bottom limit of the area to scan or take pictures.
Top	Top limit of the area to scan or take pictures.

Presets
In the **Presets** field the following different predefined settings for the field of view (FoV) are listed.

Preset	Horizontal FoV [°]	Vertical FoV [°]
Custom View	User defined	User defined
Quick Scan	Defined by Quick Scan aiming	User defined (default: -45 to +90)
Rectangle 60x60	60	60
Rectangle 90x90	90	90
Rectangle 360x60	360	60

Preset	Horizontal FoV [°]	Vertical FoV [°]
Rectangle 360x90	360	90
Target All	360	270

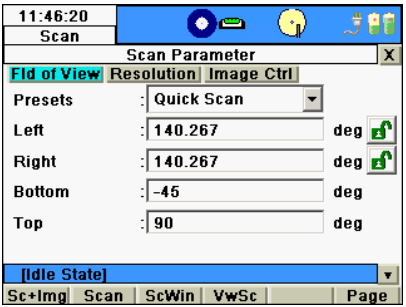
All presets except **Custom View** and **Quick Scan** have fixed values for left/right and bottom/top that cannot be edited.

Available commands:

Command	Function
Sc+Img	Start scan and image acquisition with selected FoV and resolution.
Scan	Start scan only with selected FoV and resolution, no images.
ScWin	Open scan window for area selection from video stream image.
VwSc	View point cloud of last scan with zoom, pan and show previous/next functionality.
Page	Switch to the **Resolution** page.
Shift -> Target	Open the **Target Definition** screen to select target ID, target height and target type.

Command	Function
Shift -> Image	Start image acquisition with selected FoV, exposure time and image resolution.

Quick Scan



In the **Quick Scan** preset the **Left**/**Right** fields show the current scanner direction. For a quick definition of the scan or image FoV aim the scanner in the desig-nated horizontal direction and press the green **Unlocked** button to lock the current scanner direction for the **Left** field. The button changes to the red **Locked**

button and the locked value is greyed out. Repeat the procedure for the **Right** field or unlock again. Then edit the default **Bottom** and **Top** fields manually if needed.

Scan Window screen

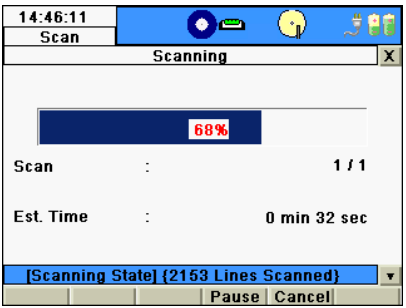
Available commands:

Command	Function
Continue	Continue and return to the **Fld of View** page of the **Scan Parameter** screen. The boundaries of a defined scan/image area will be copied into the corresponding fields.

Command	Function
Scan	Return to **Fld of View** page and start a scan only of the specified area.
Scan & Image	Return to **Fld of View** page and start a scan and image acquisition of the specified area.
Image	Start image acquisition of the specified area.
Zoom In	Zoom in to the centre of the video camera image.
Zoom Out	Zoom out from the centre of the video camera image.
Seek	Select a point in the video camera window to define it as the new window centre. The scanner rotates accordingly in horizontal and vertical direction to re-position the crosshair. In activated mode the icon turns red.
Fence	Select the scan/image area by fencing the area in the current video camera image. In activated mode the icon turns red.
Slide	Use the slider for vertical camera alignment.

Command	Function
Corner	Press one of the four corner buttons to define the current position of the crosshair as a corner of a new scan/image area. Orientate the scanner to any other direction and press the opposite corner button to define the opposite corner of the new scan/image area. Once selected the icon turns green.

Scanning screen

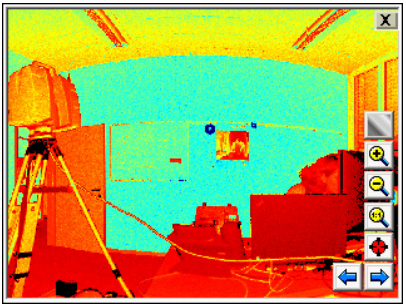


Field	Description
Progress bar	Scan progress in percent.
Scan	Number of scan.
Est. Time	Estimated time to finish scan.

Available commands:

Command	Function
Pause	Pause current scan. Once paused the button changes to **Resume**. Press again to resume paused scan.
Cancel	Cancel current scan and return to the **Fld of View** menu.

View scan screen



Available commands:

Command	Function
Colourise	Switch between coloured and black & white intensity display.
Zoom In	Zoom in to the centre of the scan image.
Zoom Out	Zoom out from the centre of the scan image.

Command	Function
Zoom 1:1	Zoom to fit complete scan to screen.
Seek	Select a point in the video camera window to define it as the new window centre. In activated mode the icon turns red.
Next	Show next scan of current station.
Previous	Show previous scan of current station.

6.2.2 Scan\Scan Parameter\Resolution

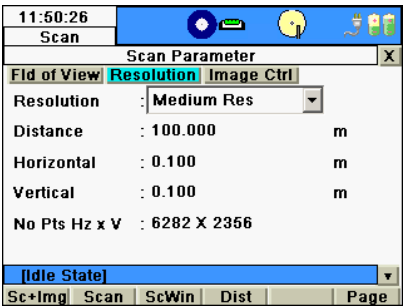
Access

Select **Main Menu, Scan** **, Scan Parameter, Resolution**.

Description

In the **Resolution** page of the **Scan Parameter** screen the horizontal and vertical point spacing can be defined by several different methods. For detailed information about the different options and commands that can be executed from this page refer to the descriptions on the following pages.

Resolution page



Field	Description
Resolution	Selection of fixed or user defined resolution settings.
Distance	Distance for which the horizontal and vertical resolution apply.
Horizontal	Horizontal resolution at given distance.
Vertical	Vertical resolution at given distance.
No Pts Hz x V	Number of points in horizontal and vertical direction for specified resolution.

Resolution settings:

Setting	Horizontal spacing	Vertical spacing	Range
Custom Res	User defined (0.5 m default)	User defined (0.5 m default)	User defined (100 m default)
Low Res	0.2 m	0.2 m	100 m
Medium Res	0.1 m	0.1 m	100 m
High Res	0.05 m	0.05 m	100 m
Highest Res	0.02 m	0.02 m	100 m

Available commands:

Command	Function
Sc+Img	Start scan and image acquisition with selected FoV and resolution.
Scan	Start scan only with selected FoV and resolution, no images.
ScWin	Open scan window for area selection from video stream image.
Dist	Open video camera window to measure the distance to the object to be scanned.
Page	Switch to the **Image Ctrl** page.
Shift -> Target	Open the **Target Definition** menu to select target ID, target height and target type.
Shift -> Image	Start image acquisition with selected FoV, exposure time and image resolution.

Measure Distance screen

Available commands:

Command	Function
Dist	Measure the distance to the point indicated by the crosshair in the video screen. The measured distance will be copied into the **Distance** field in the **Resolution** page of the **Scan Parameter** screen.
Zoom In	Zoom in to the centre of the video camera image.

Command	Function
Zoom Out	Zoom out from the centre of the video camera image.
Seek	Select a point in the video camera window to define it as the new window centre. The scanner rotates accordingly in horizontal and vertical direction to re-position the crosshair. In activated mode the icon turns red.

6.2.3 Scan\Scan Parameter\Image Control

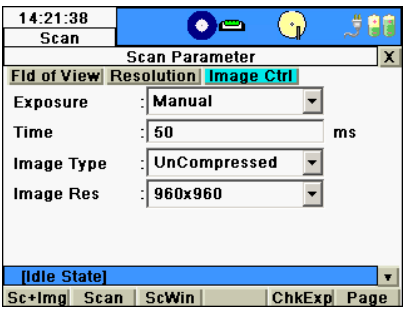
Access

Select **Main Menu, Scan** **, Scan Parameter, Image Ctrl**.

Description

In the **Image Ctrl** page of the **Scan Parameter** screen the parameters of the internal camera can be defined. Please refer to the descriptions on the following pages for detailed information about the different options and commands that can be executed from this page.

Image Ctrl page



Field	Option	Description
Exposure	**Automatic**	Image exposure time for each single image is calculated automatically.
	Manual	Image exposure time is set manually. See **Time** field.
Time		Exposure time in ms (milliseconds) for manual exposure.
Image Type	**Compressed**	Images are stored in compressed J2X format with single image size of approx. 0.5 MB to 0.75 MB. The only supported resolution is 1920 x 1920 pixels.
	Uncompressed	Images are stored in uncompressed RAW format with single image size of approximately 3.5 MB. Different image resolutions are supported.

Field	Option	Description
Image Res	**1920x1920**	Set single image resolution to 1920 x 1920 pixels.
	960x960	Set single image resolution to 960 x 960 pixels.
	640x640	Set single image resolution to 640 x 640 pixels.

Available commands:

Command	Function
Sc+Img	Start scan and image acquisition with selected FoV and resolution.
Scan	Start scan only with selected FoV and resolution, no images.
ScWin	Open scan window for area selection from video stream image.
ChExp	Open video camera window to check and adjust exposure time for manual exposure time setting.
Page	Switch to the **Fld of View** page.

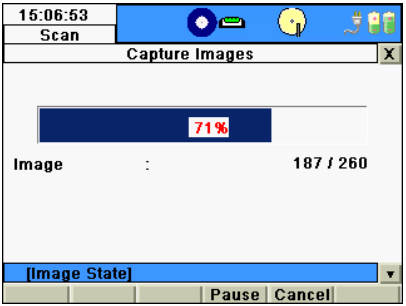
Command	Function
Shift -> Target	Open the **Target Definition** screen to select target ID, target height and target type.
Shift -> Image	Start image acquisition with selected FoV, exposure time and image resolution.

Check Exposure screen

Available commands:

Command	Function
Continue	Continue and return to the **Image Ctrl** page of the **Scan Parameter** screen.
Seek	Select a point in the video camera window to define it as the new window centre. The scanner rotates accordingly in horizontal and vertical direction to re-position the crosshair. In activated mode the icon turns red.
Slider	Move slider to adjust exposure time in the video camera window from 0 ms to 800 ms and transfer setting to the **Time** field of the **Image Ctrl** page in the **Scan Parameter** screen.

Capture Images screen



Field	Description
Progress bar	Image acquisition progress in percent.
Image	Number of images already acquired / number of total images to be acquired.

Available commands:

Command	Function
Pause	Pause current image acquisition process. Once paused the button changes to **Resume**. Press again to resume paused image acquisition process.
Cancel	Cancel the current image acquisition process and return to the **Image Ctrl** page in the **Scan Parameter** screen.

6.2.4 Scan\Scan Parameter\...\Target Definition

Access

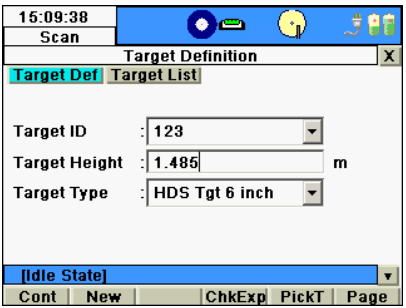
Select **Main Menu, Scan** **, Scan Parameter,**

Fld of View/ Resolution/ ImageCtrl, Shift->Target.

Description

In the **Target Definition** screen all options for target acquisition are available.

Target Def page



Field	Description
Target ID	Target ID. May include letters such as A-Z, a-z, numbers from 0-9 and any special characters of the virtual keyboard except "[" and "]".
Target Height	Target height in meters from target base point to target centre.
Target Type	List of target types which are supported by the scanner.

Target Type:

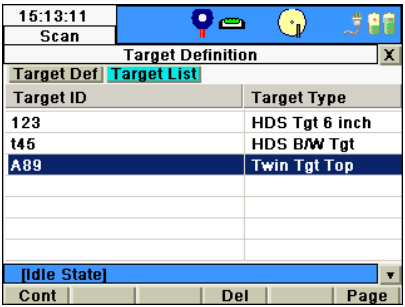
Type	Description
HDS Tgt 6 inch	HDS 6" circular planar target
HDS Tgt 3 inch	HDS 3" x 3"square planar target
HDS Sphere Tgt	HDS 6" spherical target
HDS B/W Tgt	HDS 6" Black&White planar target
Twin Tgt Top	Top target of Twin Target Pole without extension. Target height automatically changes to **1.900 m**.
Twin Tgt Btm	Bottom target of Twin Target Pole without extension. Target height automatically changes to **0.200 m**.

Type	Description
Twin Top/Ext	Top target of Twin Target Pole with extension. Target height automatically changes to **2.150 m**.
Twin Btm/Ext	Bottom target of Twin Target Pole with extension. Target height automatically changes to **0.450 m**.

Available commands:

Command	Function
Cont	Continue and start target acquisition process for all targets listed in the **Target List** page.
New	Define a new target with target ID, target height and target type. Once pressed the button is labeled **List** which allows to select again from a drop-down list in the **Target** field.
ChkExp	Open video camera window to check and adjust exposure time for manual exposure time setting.
PickT	Select target centre from the video camera image. After selection, the target is listed on the **Target List** page as a candidate for target acquisition.
Page	Switch to the **Target List** page.

Target List page

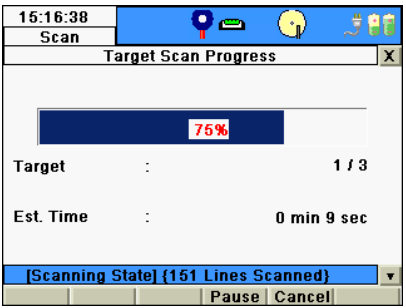


Field	Description
Target ID	List of all defined target IDs to be acquired.
Target Type	Target type of the selected target ID.

Available commands:

Command	Function
Cont	Continue and start target acquisition process for all targets listed in **Target List**.
Del	Delete the selected target from the **Target List**.
Page	Switch to the **Target Def** page.

Target Scan Progress screen

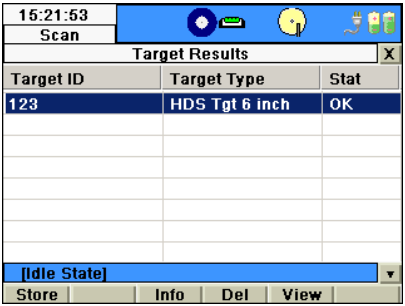


Field	Description
Progress bar	Current target scan progress in percent.
Target	Number of targets already scanned / number of total targets to be scanned.
Est. Time	Estimated time to finish current target scan.

Available commands:

Command	Function
Pause	Pause current target scan process. Once paused the button changes to **Resume**. Press again to resume paused target scan process.
Cancel	Cancel current target scan process and continue to the **Target Results** screen.

Target Results screen

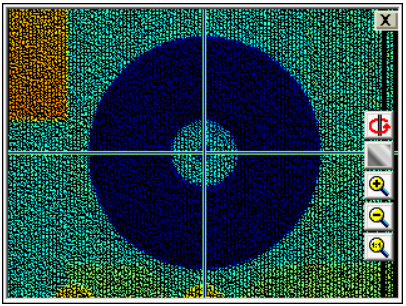


Field	Description
Target ID	Target ID of scanned target.
Target Type	Target type of scanned target.
Stat	Status of scanned target. **OK** indicates a sucessful acquisition of the target centre. A bad target centre acquisition is marked as **Failed**.

Available commands:

Command	Function
Store	Store all targets listed in the **Targets Results** list.
Info	Open **Info Targets Results** screen with information about the selected target.
Del	Delete selected target from the **Targets Results** list.
View	View point cloud of selected target scan.
Shift -> Redo	Repeat target scan of target which has been selected in the **Target Results** list.

View Target screen

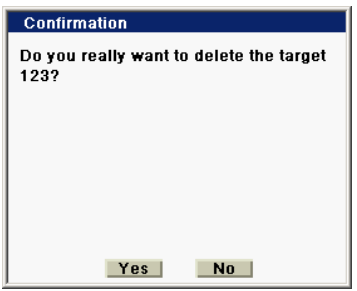


Available commands:

Command	Function
Rotate	Rotate the target point cloud counter-clockwise by increments of 30°.
Change colour	Switch between coloured and black & white intensity display.
Zoom In	Zoom in to the centre of the scan image.

Command	Function
Zoom Out	Zoom out from the centre of the scan image.
Zoom 1:1	Zoom back to fit complete target scan to screen.

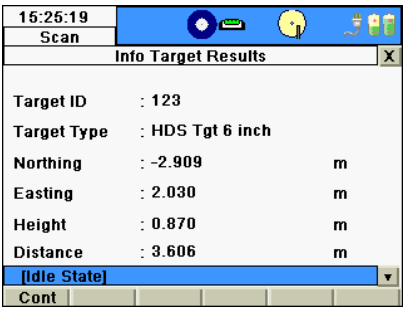
Confirmation message



Option	Description
Yes	Confirm deletion of selected target and return to the **Targets Results** screen.

Option	Description
No	Cancel deletion of selected target and return to the **Targets Results** screen.

Info Target Results screen



Field	Description
Target ID	Target ID of selected target.
Target Type	Target type of selected target.

Field	Description
Northing	Northing of target base point.
Easting	Easting of target base point.
Height	Height of target base point.
Distance	Slope distance from scanner base point to target base point.

Available commands:

Command	Function
Cont	Continue and return to **Target Results** screen.

7 Manage

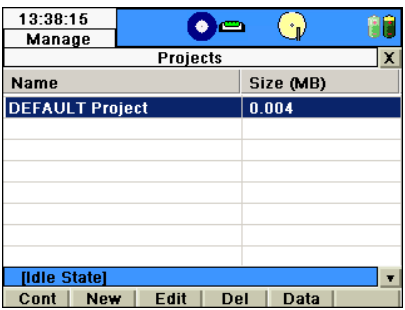
Access

Select **Main Menu, Manage** .

Description

In the **Manage** menu all commands for project management on the scanner are available.

Manage Projects screen



Field	Description
Name	Unique name of the project.
Size (MB)	File size (in MB) of the project on the scanner's hard disc.

Available commands:

Command	Function
Cont	Confirm selection and return to previous screen.
New	Create new project with project name, description and name of creator.
Edit	Edit description and creator of selected project. Also show name, date and size of existing project.
Del	Selected project will be deleted after confirmation.
Data	Show data details of selected project such as station name, scan name, scan view, target ID, target type and target view.
Shift -> Trans	Transfer selected project or all projects to a USB memory storage device.

7.1 Manage\New Project

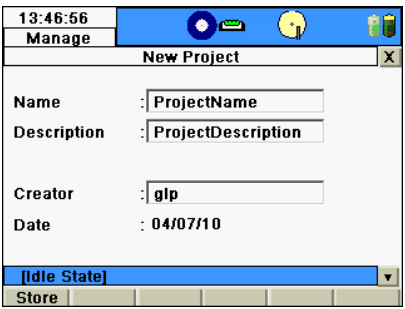
Access

Select **Main Menu, Manage** **, New**.

Description

In the **New Project** screen a new project with details such as name, description and creator can be created.

New Project screen



Field	Description
Name	Enter a unique project name. The name may be up to 14 characters long and may include letters such as A-Z, a-z, numbers from 0-9 and the special characters "-" and "_".
Description	Enter a short description of the project. Input is optional.
Creator	The person's name/abbreviation who is creating the scan project. Input is optional.
Date	Date of creation. Appears automatically and cannot be edited.

Available commands:

Command	Function
Store	Store the new project with description, creator and date on the scanner's hard disc and return to the **Manage Projects** screen.

7.2 Manage\Edit Project

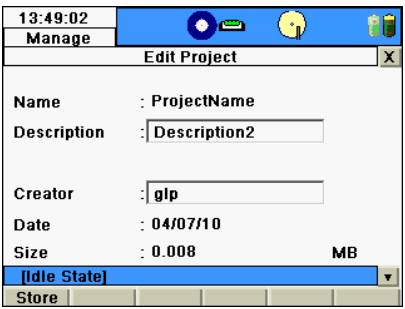
Access

Select **Main Menu, Manage** **, Edit**.

Description

In the **Edit Project** screen the description and creator the selected project can be changed. Name, date and size of the selected project are listed but are not editable.

Edit Project screen



Field	Description
Name	Name of selected project. Not editable.
Description	Edit/add project description.
Creator	Edit/add creator details.
Date	Creation date of selected project. Not editable.
Size	File size of selected project. Not editable.

Available commands:

Command	Function
Store	Store new information and return to the **Manage Projects** screen.

7.3 Manage\Delete Project

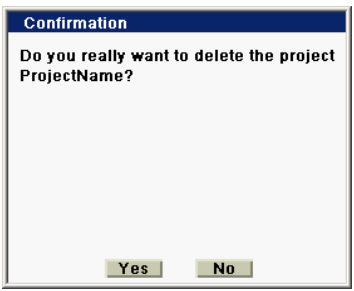
Access

Select **Main Menu, Manage** **, Del**.

Description

In the **Delete Project** screen an existing project can be deleted from the scanner's hard disc.

Confirmation message



Option	Description
Yes	Confirm deletion of the selected project. ☞ **A deleted project cannot be restored.**
No	Decline deletion of the selected project.

7.4 Manage\Data

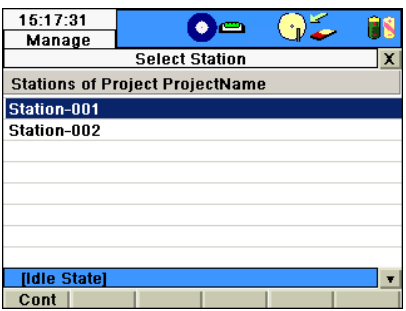
Access

Select **Main Menu, Manage** **, Data**.

Despription

In the **Data** screen details of scan data are available such as station name, scan name, target ID, target type and target coordinates. Point clouds of scans and target scans can be viewed.

Select Station screen

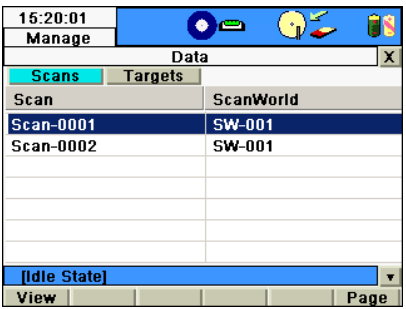


Field	Description
Stations of Project	List of available stations in the selected project.

Available commands:

Command	Function
Cont	Confirm station selection and continue to **Manage Data** screen.

Scans page

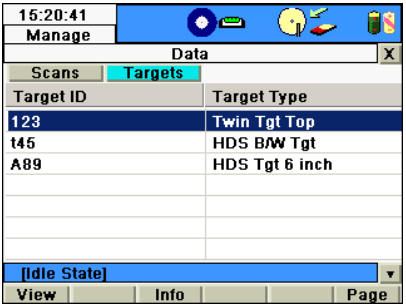


Field	Description
Scan	All scans from the selected station are listed.
ScanWorld	The ScanWorld of the selected scan. The system creates a new ScanWorld whenever the current setup changes.

Available commands:

Command	Function
View	View the point cloud of the selected scan.
Page	Switch to the **Targets** page.

Targets page



Field	Description
Target ID	List of all targets that have been acquired on the selected station.
Target Type	The target's associated target type.

Available commands:

Command	Function
View	View point cloud of the selected target scan.
Info	Show target results of the selected target such as target ID, target type, northing, easting, height and distance from scanner. Coordinates and distances refer to the target base point. For details about the target results refer to chapter "6.2.4 Scan\Scan Parameter\...\Target Definition".
Page	Switch to the **Scans** page.

7.5 Manage\Transfer Project

Access	Select **Main Menu, Manage** **, Shift->Trans**.
Description	In the **Transfer** screen projects can be transferred from the scanner's hard disc to an external USB memory storage device. Refer to chapter "10.2 Tools\Transfer" for more information.

8 Status

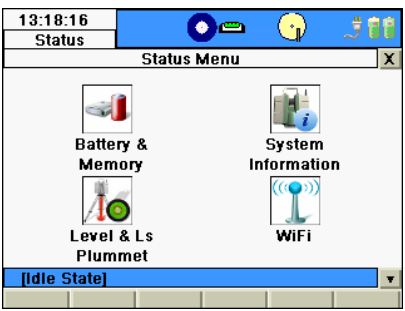
Access

Select **Main Menu, Status** .

Description

The **Status Menu** provides general status information about different components of the scanner such as battery and memory, general system information, level and laser plummet and WiFi status information.

Status Menu screen



Icon	Command	Description
Battery & Memory	**Battery**	Status information about internal battery, external battery and AC power supply.
	Memory	Status information about size and free space of internal hard disc's data partition.
System Informa-tion	**Instrument**	Status information about instrument type, serial number, equipment number and system language.
	Firmware	Status information about installed firmware version and firmware maintenance expiry date.
Level & Ls Plummet	**Level**	Numerical and graphical display of instrument's tilt.
	Plummet	Switch laser plummet on/off.
	Compens	Switch dual-axis compensator on/off. Define how scanner should react when compensator goes out of range.

Icon	Command	Description
WiFi	WiFi	Define region code and TX power for external WiFi communication device. The WiFi device should be connected to the scanner before this function is selected.

8.1 Status\Battery & Memory

Access

- Select **Main Menu, Status** **, Battery & Memory** .

OR

- Press one of the power icons in the status bar to access the **Battery** page directly.

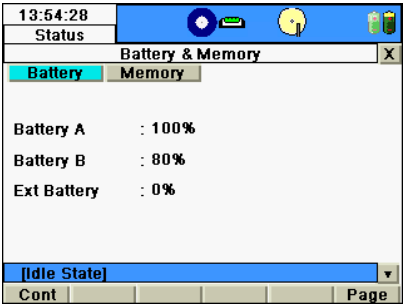
OR

- Press the memory icon in the status bar to access the **Memory** page directly.

Description

In the **Status, Battery & Memory** screen all information about the scanner's battery and memory status are available.

Battery page



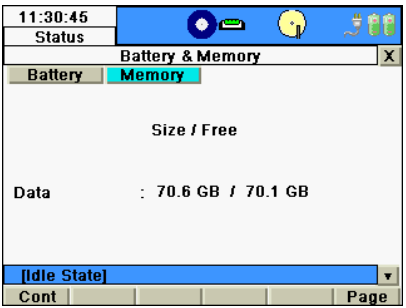
Field	Description
Battery A	Percentage of remaining power of battery A in com-partment on scanner's front side (the side with touch screen).
Battery B	Percentage of remaining power of battery B in com-partment on scanner's reverse side (the side without touch screen).
Ext Battery	Percentage of remaining power of external battery.

☞ The battery status is also indicated by the power icons in the status bar.
Refer to "3.3 Status Bar" for more information.

Available commands:

Command	Function
Cont	Continue and return to previous menu.
Page	Switch to the **Memory** page.

Memory page



Field	Option	Description
Data	**Size**	Total space for data storage on data partition of scanner's hard disc.
	Free	Free space for data storage on data partition of scanner's hard disc.

Available commands:

Command	Function
Cont	Continue and return to previous menu.
Page	Switch to the **Battery** page.

8.2 Status\System Information

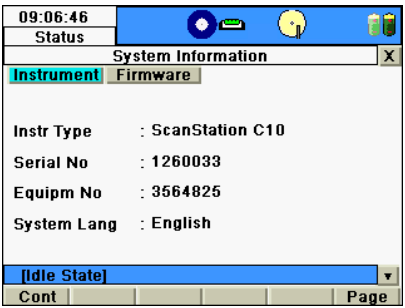
Access

Select **Main Menu, Status** **, System Information** .

Description

The **System Information** screen provides detailed information about instrument type, serial number, system language and firmware version.

Instrument page

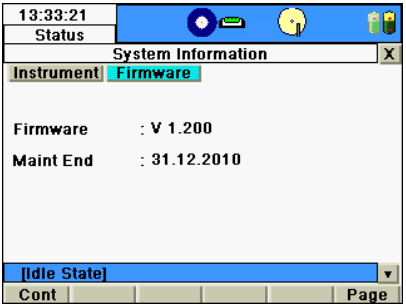


Field	Description
Instr Type	Instrument type.
Serial No	Serial number of the instrument. See also serial number plate on instrument's bottom side.
Equipm No	Leica unique identification code of the instrument.
System Lang	Active system language.

Available commands:

Command	Function
Cont	Continue and return to **Status Menu**.
Page	Switch to the **Firmware** page.

Firmware page



Field	Description
Firmware	Firmware version of the installed onboard software.
Maint End	Expiry date of firmware maintenance period. All firmware versions with release date prior to this date can be uploaded.

Available commands:

Command	Function
Cont	Continue and return to **Status Menu**.
Page	Switch to the **Instrument** page.

8.3 Status\Level & Laser Plummet

Access

- Select **Main Menu, Status** **, Level & Ls Plummet** .

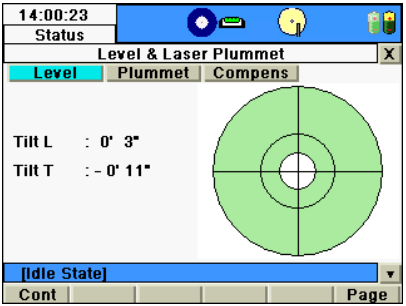
OR

- Press the compensator icon in the status bar to access the **Level** page directly.

Description

The **Level & Laser Plummet** screen provides detailed information about the electronic level, the laser plummet and the compensator settings.

Level page

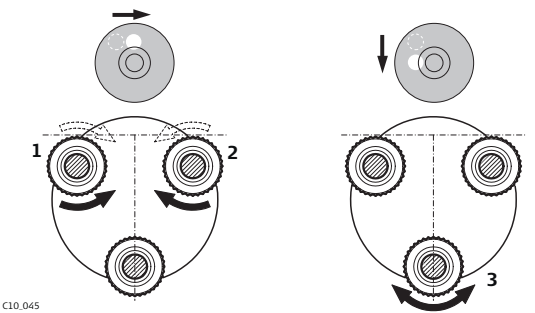


Field	Option	Description
Tilt L	**-**	Longitudinal tilt of the vertical axis.
Tilt T	**-**	Transversal tilt of the vertical axis.
Bubble Level	**green**	Tilt L and Tilt T < 5', level is within compensator range. The accuracy of the compensator in the ± 5' working range is higher than 1.5''.
	red	Tilt L or Tilt T > 5', level is out of compensator range.

As soon as the bubble level colour changes from green (within compensator range) to red (outside of ± 5' compensator range) the compensator icon in the status bar changes from to .

The level moves linearly with the inclination values **Tilt L** and **Tilt T**. It moves down if the value in **Tilt L** increases and vice versa. It moves left if the value in Tilt T gets bigger and vice versa.

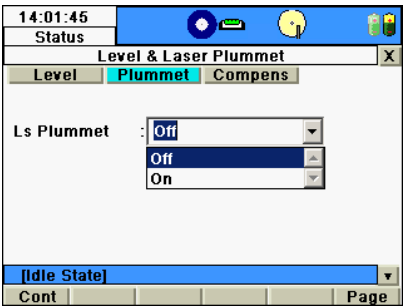
Align the scanner side cover with the touch screen parallel to two of the tribrach footscrews. Rotating these two footscrews then causes the bubble to move only left/right. Rotating the third footscrew causes the bubble to move only up/down.



Available commands:

Command	Function
Cont	Continue and return to previous menu.
Page	Switch to the **Plummet** page.

Plummet page



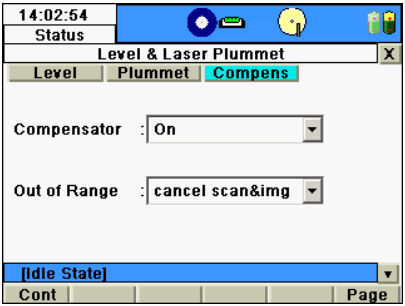
Field	Option	Description
Ls Plummet	**On**	Turn the red laser plummet on.
	Off	Turn the red laser plummet off.

By default the laser plummet is **Off** after system boot.
Changing this setting to **On** turns the laser plummet on immediately. It is only visible when the **Level & Laser Plummet** screen is active.

Available commands:

Command	Function
Cont	Continue and return to previous menu.
Page	Switch to the **Compens** page.

Compens page



Field	Option	Description
Compensator	**On**	Turns the compensator on.
	Off	Turns the compensator off temporarily. After system restart, the compensator will be on again.
	Always Off	Turns the compensator off. After system restart, the compensator will remain off.

Field	Option	Description
Out of Range	**Cancel scan&img**	If the compensator goes out of range, cancel the current scan or image acquisition.
	Flag data & cont	If the compensator goes out of range, continue current scan or image acquisition, but flag unleveled object for subsequent data import.

By default the compensator is **On** after system boot.
When changing this setting to **Off** or **Always Off** the compensator icon in the status bar changes to .

Available commands:

Command	Function
Cont	Continue and return to previous menu.
Page	Switch to the **Level** page.

8.4 Status\WiFi

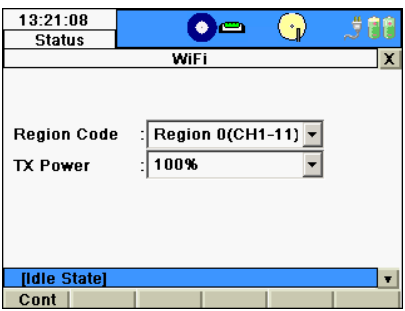
Access

Select **Main Menu, Status** , **WiFi** .

Description

In the **WiFi** screen the communication parameters of the external WiFi device can be defined. Depending on the local regulations it might be necessary to adjust these parameters.

WiFi screen



Field	Option	Description
Region Code	**Region 0(CH1-11)** **Region 1(CH1-13)** **Region 2(CH10-11)** **Region 3(CH10-13)** **Region 4(CH14)** **Region 5(CH1-14)** **Region 6(CH3-9)** **Region 7(CH5-13)**	Restricts the external WiFi device to a particular sub-set of the 802.11 channels. Depending on local regulations the required setting might be different.
TX Power	**100%** **75%** **50%** **25%** **Lowest**	Controls the output power of the external WiFi device. At 100% the output power is 100 mW.

Available commands:

Command	Function
Cont	Confirm and transfer current settings to the connected external WiFi device.

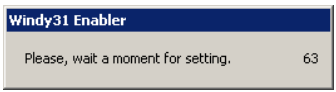
- Region Code and TX Power settings typically should not need to be changed. The scanner provides these in case there are changes to national laws which regulate the use of the 2.4GHz band. Restrictions of channel use and power have existed in the past and could be reintroduced.
- The following EEA member states apply restrictions on the placing on the market or on the putting into service or require authorisation for use:
  - France
  - Italy
  - Norway (if used in the geographical area within a radius of 20km from the centre of Ny-Ålesund)
- The system supports the Windy31 USB WiFi adapter for wireless communication with the Leica *Cyclone* SCAN interface.
  For purchase information of this third-party product check
  http://synetusa.com/m3/sub1.php

  or contact

  SYNET Electronics, Inc.
  201 Gates Road, Unit C, Little Ferry, NJ07643, USA
  Toll Free : 1-866-US-SYNET (877-9638)
  Tel : (201) 931-1177
  e-mail : sales@synetUSA.com

Installing the Windy31 USB WiFi adapter

1. After scanner bootup, plug in the Windy31 in the scanner's USB socket.
   All files to support the Windy31 USB WiFi adapter are installed with the Leica ScanStation C10 firmware. No additional files need to be installed.
2. After a maximum of 60 sec, the **Windy31 Enabler** window appears to initialise the USB WiFi adapter with the current settings from the ScanStation C10 **WiFi** page.



3. Wait for the counter to finish and the message to disappear.
4. If required in your country, change the values for **Region Code** and **TX Power** on the **WiFi** page to your country specific settings and press **Cont** to transfer the new settings to the USB WiFi adapter.
   The **Windy31 Enabler** window appears again. Wait for the counter to finish and the message to disappear.
5. On your laptop computer with Cyclone SCAN installed, activate the wireless network device and connect to network **Leica C10 126xxxx WiFi** with 126xxxx being the scanner's serial number.
6. Start Cyclone and connect to the ScanStation C10 wirelessly in the same way as with an Ethernet cable connection.

For details about Cyclone refer to the Cyclone online help menu or the Leica HDS training manual provided by your regional Leica HDS support.

9 Configuration

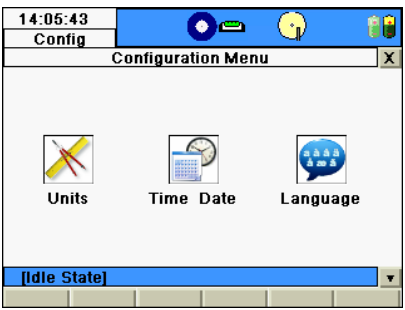
Access

Select **Main Menu, Config** .

Description

In the **Configuration Menu** all commands for the configuration of the system are available.

Configuration Menu screen



Icon	Command	Description
Units	**Distance Unit**	Select unit for distances (Metre, Int Ft, Us Ft).
	Distance Dec	Select number of decimal digits for distance display.
Time & Date	**Local Time**	Set local time.
	Local Date	Set local date.
Language	**Language**	Select language for the user interface or delete a language from the list.

9.1 Config\Units

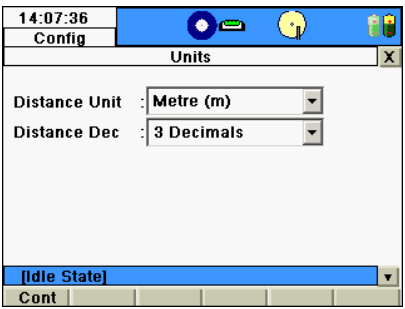
Access

Select **Main Menu, Config** , **Units** .

Description

In the **Units** screen linear units and the number of decimals can be defined.

Units screen



Field	Option	Description
Distance Unit	**Metre (m)**	Metre: Uses SI base unit metre.
	Int Ft (fi)	International feet: Uses 1 ft = 1' = 12 in. = 1/3 yd = 30.48 cm
	US Ft (ft)	U.S. survey feet: Uses 39,37 in. = 1 m (1 U.S. survey foot = 1200/3937 m equates approximately 30.48006 cm)
Distance Dec	**0** to **3 Decimals**	Number of decimal digits for distance related fields.

Available commands:

Command	Function
Cont	Confirm and return to the **Configuration Menu**.

9.2 Config\Time & Date

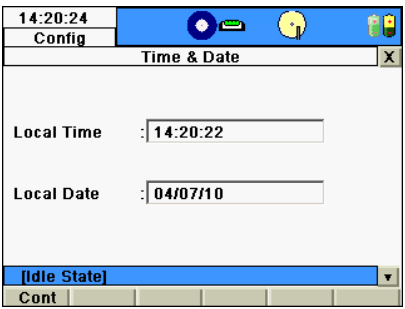
Access

Select **Main Menu, Config** , **Time & Date** .

Description

In the **Time & Date** screen the system time and date are defined.

Time & Date screen



Field	Description
Local Time	Enter the local time in the format **hh:mm:ss**.
Local Date	Enter the local date in the format **MM/DD/YY**.

Available commands:

Command	Function
Cont	Confirm and return to the **Configuration Menu**.

9.3 Config\Language

Access

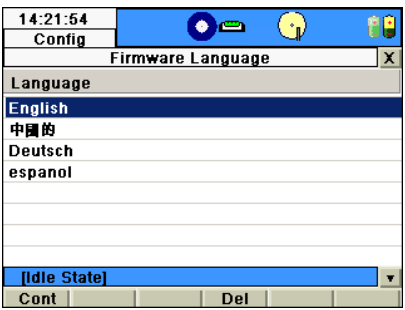
Select **Main Menu, Config** **, Language** .

Description

In the **Firmware Language** screen a list of available languages for the user interface is shown. A language can be selected or deleted from the list.

Additional languages can be installed by uploading language files. Refer to "10.2 Tools\Transfer" for more information.

Firmware Language screen



Field	Description
Language	List of installed languages on the scanner.

Available commands:

Command	Function
Cont	Activate the selected language and return to the **Main Menu**.
Del	Delete the selected language. English is part of the firmware and cannot be deleted.

10 Tools

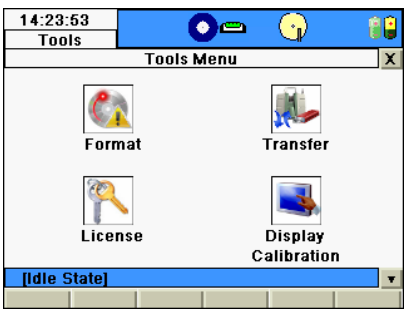
Access

Select **Main Menu, Tools** .

Description

In the **Tools** menu all commands for disc formatting, data transfer, license management and display calibration are available.

Tools Menu screen



Icon	Command	Description
Format	**Confirmation**	Format the complete data partition of the internal hard disc. **All project data will be erased.**
Transfer	**Projects**	Transfer selected project or all projects to a USB memory storage device.
	System Files	Upload a new firmware or firmware languages to the instrument.
License	**Manual**	Enter license key manually.
	Upload	Upload license key file from a USB memory storage device.
Display Calibration	**Touch Calibration**	Recalibrate the touch screen by clicking three points on the display.

10.1 Tools\Format

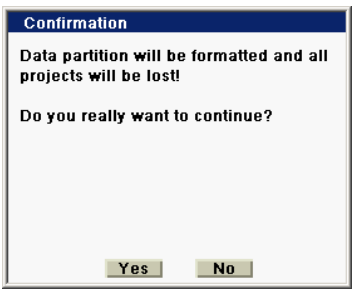
Access

Select **Main Menu, Tools** , **Format** .

Description

In the **Format** screen the data partition of the scanner's hard disc can be formatted to erase all data on it.

Confirmation message



Option	Description
Yes	Starts formatting the data partition. ☞ **All project data will be erased.**
No	Cancels the formatting process and returns to the **Tools** menu.

☞

- Formatting is irreversible. It is recommended to backup any project files before starting **Format**.
- The **Format** command does not affect any system files. Only scan data will be erased.

10.2 Tools\Transfer

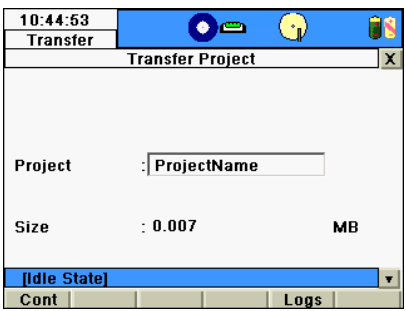
Access

Select **Main Menu, Tools** , **Transfer** .

Description

In the **Transfer** menu projects can be transferred from the scanner's hard disc to an external USB memory storage device and new firmware and languages can be uploaded from an external USB memory storage device to the scanner.

Transfer Project screen



Field	Description
Project	Name of the project to be transferred. Touch the name field to open the **Manage, Projects** menu for selecting another project.
Size	File size (in MB) of the selected project.

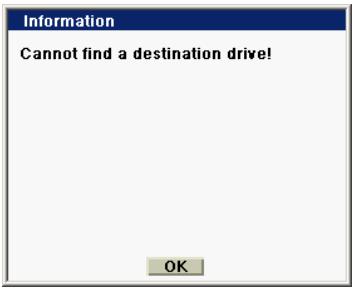
Available commands:

Command	Function
Cont	Transfer the selected project to the connected USB memory storage device into the folder **\Scan-Projects\Project**.
Logs	Transfer system log files to the connected USB memory storage device into the folder **\Logs**.

The file system on the USB memory storage device must be NTFS, FAT32 or FAT.

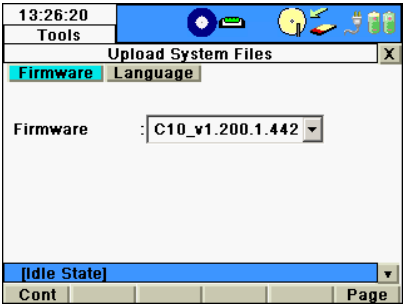
Information message

In case that no USB memory storage device has been connected, the following screen will appear:



Please check whether the USB memory storage device has been connected properly and try again.

Firmware page



Field	Description
Firmware	Select firmware file (*.fw) from connected USB memory storage device.

- The firmware file (*.fw) must be located in the main directory of the USB memory storage device.
- Firmware files are named for example **C10_v1.2.3.456.fw** with **1.2** being the firmware version in this case.

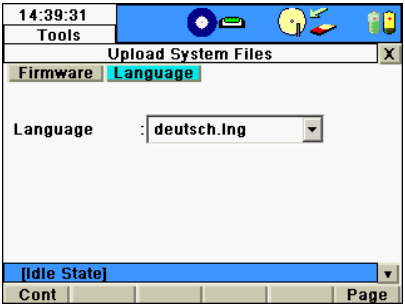
- Uploading a new firmware file can take up to 40 min. Ensure sufficient battery power or provide AC power and do not interrupt power supply during the upload process.
- Refer to the document **UploadSSC10.pdf** which is enclosed with each new firmware file for detailed instructions.

Available commands:

Command	Function
Cont	Starts the upload process of the selected firmware file.
Page	Switch to the **Languages** page.

After the upload process, the instrument restarts two times and then displays the **Main Menu**.

Language page



Field	Description
Language	Select language file (*.lng) from connected USB memory storage device.

- The language file (*.lng) must be located in the main directory of the USB memory storage device.

Available commands:

Command	Function
Cont	Starts the upload process of the selected language file.
Page	Switch to the **Firmware** page.

After the upload process, the language is available as an additional entry in the **Language** page of the **Firmware Language** screen.
Refer to chapter "9.3 Config\Language" for more information.

10.3 Tools\License

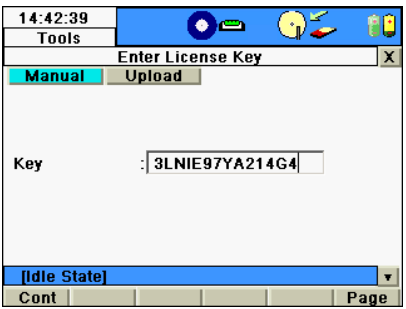
Access

Select **Main Menu, Tools** , **License** .

Description

In the **License** screen the firmware maintenance license key can be entered manually or uploaded via key file. A license key is required to set the firmware maintenance expiry date.

Manual page

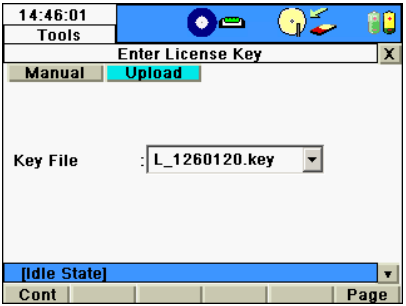


Field	Description
Key	Enter the 14-digit license key manually. ☞ The license key is not case sensitive.

Available commands:

Command	Function
Cont	Confirm the entered license key.
Page	Switch to the **Upload** page.

Upload page



Field	Description
Key File	Select the license key file (*.key) from the connected USB memory storage device to load onto the scanner.

- The license key file (*.key) must be located in the main directory of the USB memory storage device.
- License key files are named for example "L_126xxxx.key" with 126xxxx being the scanner's serial number.

Available commands:

Command	Function
Cont	Confirm and load the license key from the selected license key file.
Page	Switch to the **Manual** page.

10.4 Tools\Display Calibration

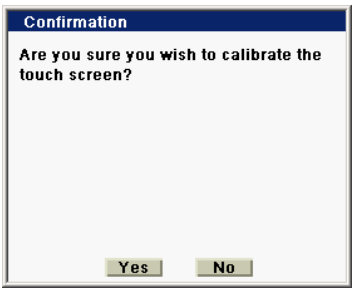
Access

Select **Main Menu, Tools** , **Display Calibration** .

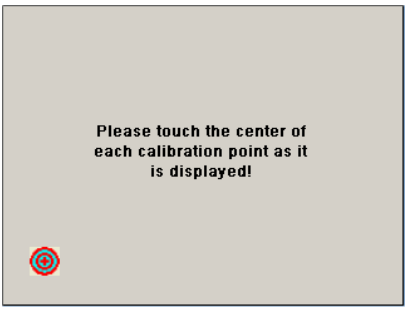
Description

In the **Display Calibration** menu the onboard touch screen can be calibrated.

Confirmation message

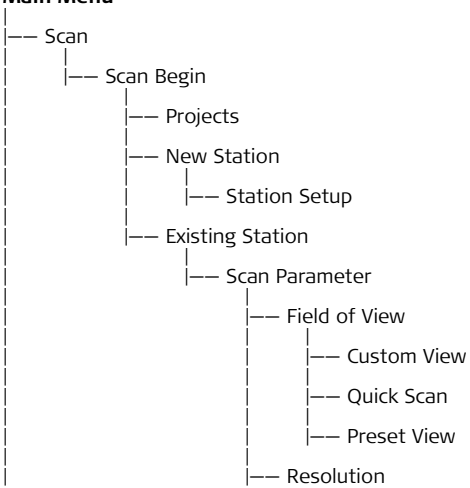


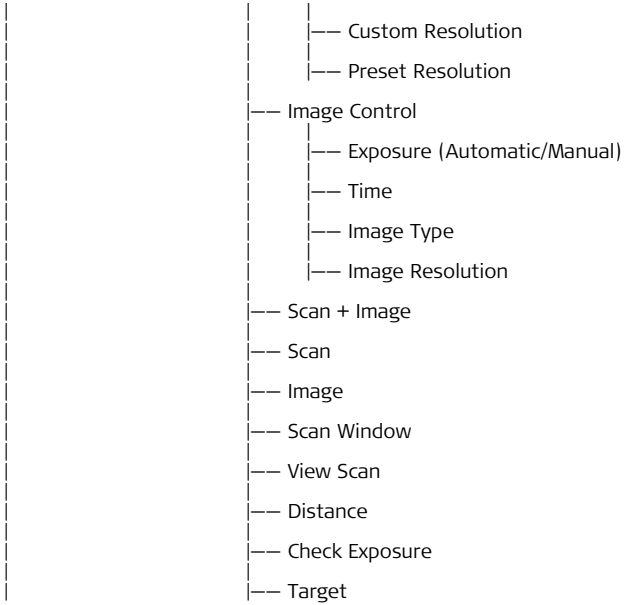
Option	Description
Yes	Start the touch screen calibration process. Then click the centres of three calibration points which appear consecutively on the display.
No	Cancel the touch screen calibration process and return to the **Tools** menu.

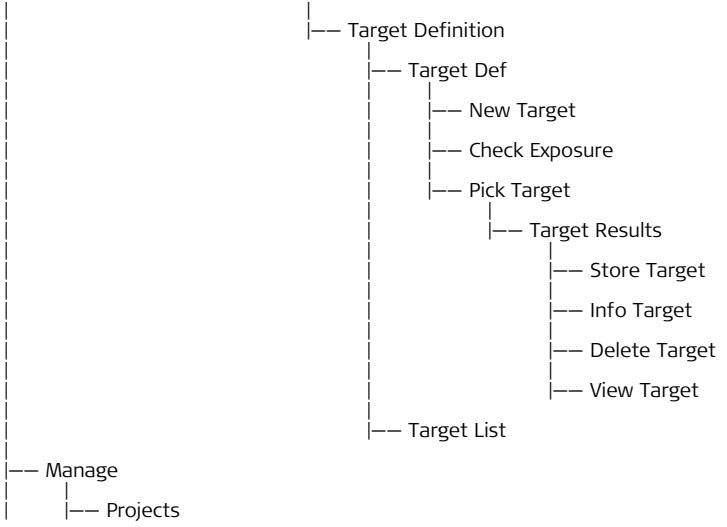


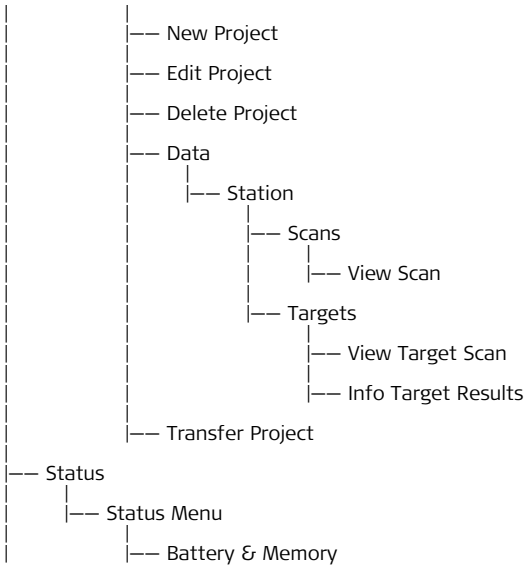
11 Menu Tree

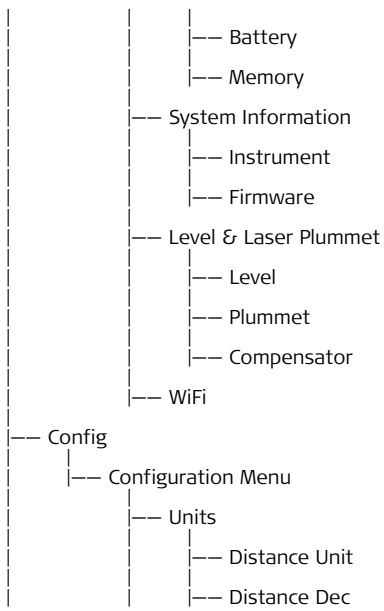
Overview

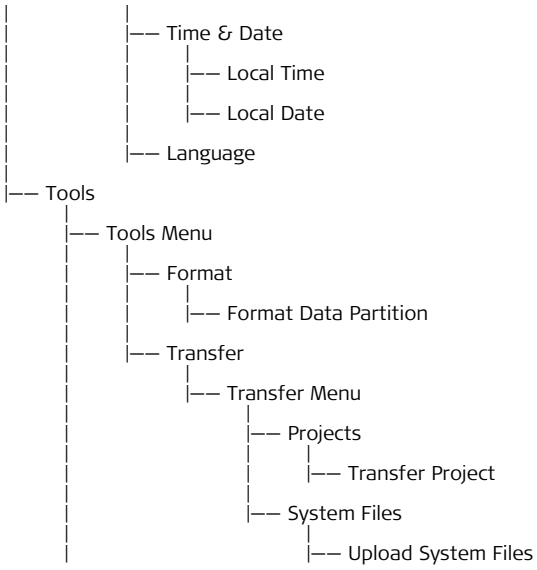


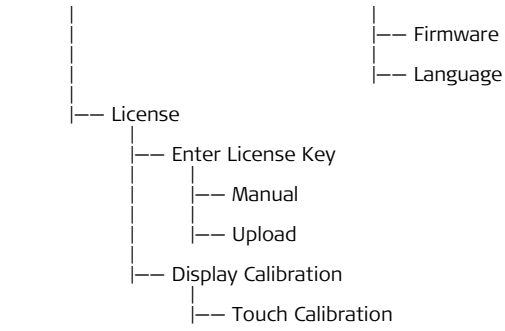

Custom Resolution
Preset Resolution
Image Control
Exposure (Automatic/Manual)
Time
Image Type
Image Resolution
Scan + Image
Scan
Image
Scan Window
View Scan
Distance
Check Exposure
Target


Target Definition
Target Def
New Target
Check Exposure
Pick Target
Target Results
Store Target
Info Target
Delete Target
View Target
Target List
Manage
Projects


New Project
Edit Project
Delete Project
Data
Station
Scans
View Scan
Targets
View Target Scan
Info Target Results
Transfer Project
Status
Status Menu
Battery & Memory


Battery
Memory
System Information
Instrument
Firmware
Level & Laser Plummet
Level
Plummet
Compensator
WiFi
Config
Configuration Menu
Units
Distance Unit
Distance Dec


Time & Date
Local Time
Local Date
Language
Tools
Tools Menu
Format
Format Data Partition
Transfer
Transfer Menu
Projects
Transfer Project
System Files
Upload System Files


Firmware
Language
License
Enter License Key
Manual
Upload
Display Calibration
Touch Calibration

Index

A
AC power supply 23, 26

B
Battery, external 23, 26, 91, 94
Battery, internal 23, 27, 91, 94

C
Check exposure 53, 57, 58, 59
Circular level 14, 17
Compensator, dual-axis 15, 24, 101, 102, 106

D
Distance 52, 74
Distance, measure 53, 54

E
Exposure, Automatic 57
Exposure, Manual 57
External memory 26

F
Field of view (FoV) 42
Horizontal 42
Vertical 42
Firmware 91, 97, 99, 111
Firmware file 129
Firmware language 120, 123
Firmware upload 126

I
Image control 40
Image resolution 52
Instrument height 18, 37
Internal hard disc 25

K
Keyboard, virtual 28

L
Language 120, 123
Language file 131
Language upload 126
Laser plummet 15, 17, 91, 101, 105
Level 14, 17, 91, 101, 102
License 123, 133
License key 133, 134
License key file 135
License key file upload 135

M
Maintenance 99, 133
Memory, external 26
Message bar 21

Q
Quick Scan 42, 44

R
Range 52

S
Serial number 2, 97, 111, 135
Set up the tripod 13, 16
Spacing, horizontal 52
Spacing, vertical 52
Status bar 21, 23, 93, 101, 107
System date 119
System time 21, 119

T
Target 43, 63, 66, 68
Target height 43, 53, 64
Target ID 53, 64, 66, 84, 87
Target list 66
Target results 69, 73, 88
Target scan 68
Target type 24, 53, 64, 66, 84, 87
Target, view 71
Title bar 21
Transport container 10
Tripod 12, 13, 16
Twin target 24, 64

U

Unit, distance 117
USB memory storage device 77, 126, 129
File system 127
USB socket 20, 111
USB WiFi adapter 111

W

Weight 10
WiFi 92, 108
Communication device 92
Output power 109
Region code 109
USB WiFi Adapter 111

781284-1.0.0en
Original text

Printed in Switzerland © 2010 Leica Geosystems AG, Heerbrugg, Switzerland

Leica Geosystems AG
Heinrich-Wild-Strasse
CH-9435 Heerbrugg
Switzerland
Phone +41 71 727 31 31
www.leica-geosystems.com

- when it has to be **right**

Leica Geosystems